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The Casimir effect in a wormhole spacetime

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Abstract

We consider the Casimir effect for a quantized massive scalar field with non-conformal coupling ξ in a wormhole spacetime whose throat is surrounded by a spherical shell. In the framework of the zeta-regularization approach we calculate the zero-point energy of the scalar field. We find that depending on values of the coupling ξ, a mass of field m and/or the throat's radius a, the Casimir force may be both attractive and repulsive, and even equals zero. © 2006 IOP Publishing Ltd.

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